

Role of Out-of-Money Options in Executive Compensation

Shalini Mahajan

The Leonard N. Stern School of Business
Glucksman Institute for Research in Securities Markets
Faculty Advisor: Rangarajan K. Sundaram
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I. INTRODUCTION

Executive stock options remain one of the most widely used tools to tie managers' compensation to performance. The use of stock options in executive compensation has risen dramatically over the last decade. Morgenson (1998) estimates that in 1997, the 200 largest US corporations had reserved 13% of their common stock for stock options to their executives. This was up from 7% in 1989. Hall and Liebman (1998) estimate that the stock options comprised 40% of CEOs' total compensation for S&P companies in 1998. This proportion was only 25% in 1992. In another study, Murphy (1999) estimates that the median cash compensation paid to S&P 500 CEOs has more than doubled since 1970 (in 1996-constant dollars), and median total realized compensation (including gains from exercising stock options) has nearly quadrupled. The shareholders and boards of directors have backed the proliferation of stock based compensation believing that these options serve to reduce agency costs and a direct equity participation gives managers an incentive to create value and enhance the stock price.

However, executive stock options are increasingly becoming a concern for the shareholders, especially when the performance bar is set too low. A typical executive stock option plan has the strike price set equal to the stock price on the day of the grant and a maturity of 10 years (Murphy, 1999). A growing number of investors claim that such option grants are too generous and do not provide sufficient incentive to executives. Furthermore, there have been several instances when firms have re-priced stock options to executives after a dismal stock price performance. A study by Professors Benner, Sundaram and Yermack of NYU Stern Business School on options re-pricing found that while only 0.7% of the executives in S&P ExecuComp database had their options re-priced in 1992, almost 2.0% of executives had their options re-priced in 1995. Such instances of option re-pricing coupled with the fact that many executives

have made significant gains from exercising stock options in late 1990s has caused the investors and shareholder activists to demand that companies set a higher hurdle rate for their managers while issuing options. In response, several firms have started issuing non-traditional stock options. These options differ from the traditional options in one or more ways and the primary purpose is to strongly motivate executive officers to achieve outstanding returns for stockholders. Two such non-traditional options that are in vogue include (i) Index options - where the strike price moves with a predefined benchmark such as an industry or market wide stock index and (ii) Out-of-money stock option - where the strike price is set so that the option is out of the money when granted. There have been some studies on indexed executive stock options. In their paper, published in 1998, Johnson and Tian examine the valuation and incentive implications of indexed stock options. But the research on out-of-money executive stock options has been negligible so far. Our paper makes a start to fill this gap.

The higher strike price in an out-of-money stock option creates stronger incentives for the executives to increase the stock price than a traditional option since the executives receive no compensation until the value of the stock exceeds the above-market exercise price. Thus, stockholders will receive significant appreciation in their investment in the company before executives can realize any gains on their premium-priced options. While the concept of out-of-money options clearly holds appeal for shareholders, it is worth examining to what extent have firms embraced the philosophy of setting a higher hurdle rate for managers. Our paper aims to do just that - examine the motives and effectiveness of issuing out-of-money executive stock options.

In our paper, we examine the issuance of out-of-money executive stock options by firms over a five-year period from 1996 to 2000. We examine the frequency of issuance and

motivation of firms to issue out-of-money stock options to their executives. We also explore the ex-post effects of out-of-money stock option plans – do firms that issue out-of-money stock options show superior subsequent stock price performance that reflects the stronger incentives to managers?

Our study can be divided into three main parts. In the first part, we examine whether the incidence of out-of-money options has increased over the period of our study i.e. 1996-2000. We look at the characteristics of out-of-money options in terms of the distribution of exercise price around the market price and the term to maturity to understand how deep out of the money options are being issued. In the second part of the paper, we study the characteristics of the firms that issue out-of-money options to their executives. We examine if the firms in our sample share any common characteristics with respect to size and industry type. We also attempt to analyze the motivation for firms to issue out-of-money options by studying the relationship between issuance of out-of-money options and factors such as past stock price performance and stock return volatility. In the final section of the paper, we examine the effects of out-of-money stock options by observing the stock price performance of firms subsequent to issuance of such options. We also attempt to quantify the loss in option value to the executives who receive out-of-money options and examine if they are being compensated by their firms in some other manner. The rest of the paper is organized as follows. Section II describes our data. Section III presents the empirical results and Section IV presents the summary.

II. DATA

The data for our analysis comes from Standard and Poors' ExecuComp database. ExecuComp reports annual compensation data for the top five officers in a sample of 1,500

firms, including those companies in S&P 500, the S&P MidCap 400, and the S&P SmallCap600. We use the ExecuComp database to extract records of all the executives that are granted stock options in the five-year period 1996 – 2000. We obtain 41,934 executive-year observations. We then isolate those observations where the exercise price is greater than the stock price at the time of the option grant. This gives us 357 executive-year observations for the period 1996 – 2000.

III. EMPIRICAL RESULTS

Part I

Incidence of out-of-money options

An examination of data collected reveals that out of a total of 41,934 executive-year observations for the period 1996 – 2000, the proportion of out-of-money stock option issuances was only 0.9%. As seen in Table 1, the proportion of out-of-money issuances declined dramatically to 0.3% in year 2000 after averaging to around 0.9% for the period 1996 –1999. We also look at the number of firms that issued out-of-money stock options over the period 1996-2000. We find that, as indicated in Table 1, the number has progressively declined from year 1996 to year 2000, with a dramatic drop in year 2000.

Table 1: Incidence of out-of-money stock options from year 1996 to year 2000

	Total executive- year observations	Percentage of out-of-money observations	# of firms issuing out of money stock options
1996	8677	1.0%	43
1997	9119	1.1%	44
1998	9478	0.7%	31
1999	8447	1.0%	33
2000	6213	0.3%	8
Total	41934	0.9%	159

One possible explanation for the sudden drop in issuance of out-of-money options in year 2000 could be that beginning March 2000, there was a widespread expectation of a sizeable decline in stock market over the medium term. This could have reduced the motivation for firms to issue out-of-money stock options lest these options create 'negative incentives' for their managers in a period of falling stock prices.

We also examine how frequently do firms issue out-of-money stock options to their executives. Our analysis reveals that out of a sample of firms that have issued out-of-money stock options over 1996-2000 period, 71% of the firms have issued these options only once. Only 4% of the firms have issued these options in four out of the five-year period under study. This suggests that issuance of out-of-money option is a one-time phenomenon for a majority of firms rather than part of a consistent compensation plan.

How deep are the out-of-money stock options?

Out-of-money options have their exercise price set higher than the stock price at time of the grant. Figure 1 in the appendix describes the distribution of the exercise price around the stock price at grant. The mean and median of the distribution is 13.7% and 23.1% respectively. Figure 1 indicates that in 46% of the cases, the exercise price exceeded the stock price by less than 10%. In 78% of the cases, the exercise price exceeded the stock price by less than 30%. An analysis of the maturity of the out-of-money options reveals that around 50% of the out-of-money options had a maturity of 10 years. The mean maturity was 8.2 years while the median was 10 years. This analysis indicates that the options are not very deep out-of-the-money, which leads us to suspect their effectiveness in extracting superior performances from the executives who receive these options. It may be possible to explore the linkage between the premium over

stock price in an out-of-money option and the average long-term equity returns for the industry in which the firm operates. However, we have not covered that analysis in this paper.

Part II

Characteristics of firms that issue out-of-money options

In this section, we examine if the firms that issue out-of-money options share any common characteristics. Our data indicates that there is no significant relationship between the size of the firm and issuance of out-of-the-money stock option grants to executives. Over our sample period, around 0.8% of executives in S&P 500 firms had out-of-money options issued to them. For the S&P MidCap 400 firms, only 0.4% of executives had out-of-money option grants and roughly 0.9% of executives of S&P SmallCap 600 firms had out-of-money option grants. We could not identify any industry wide characteristics across firms that issued out-of-money options in the period 1996-2000. The firms belong to diverse industry groups that include both human capital intensive industries such as financial services, media, information technology and health care as well as those industries that are not human capital intensive such as steel, oil & gas, chemicals and manufacturing sector.

Historic share price performance and issuance of out-of-money stock options by firms

We study the historic share price performance of firms that issued out-of-money stock options in order to see if poor stock price performance was the motivating factor for the firms to issue such options to their managers. As indicated in Figure 2, there appears to be no significant relationship between the 3-year raw returns to the shareholders and issuance of out-of-money options. Using executive-year as unit of observations, we find that across all firms with 3-year stock return of -30% or less, 1.7% of the executives had been issued out-of-money option grants.

This is the highest frequency seen in the distribution. This makes intuitive sense since the firms with poor share price performance are more likely to issue out-of-money options to their executives to induce them to perform better in the future. However, the relationship breaks down for the rest of the distribution; the frequency of out-of-money option grants to executives remains more or less constant at 0.9% irrespective of the 3-year stock price performance by firms. This may suggest that only when the past stock price performance is very disappointing i.e. raw returns less than -30% over the past 3 years, firms tend to hold the executives accountable for the performance and offer out-of-money options instead of at-the-money options.

We performed a regression analysis between the premium of exercise price over the stock price at the time of option grant and the 3-year stock price performance of firms that issue out-of-money stock options. Table 2 presents the summary of our regression analysis.

Table 2: Regression Analysis: Premium over stock price vs. 3-year stock price performance

The regression equation is				
PREMIUM % = 25.8 - 0.135 TRS3YR				
Predictor	Coef	SE Coef	t	p
Constant	0.25791	0.01479	17.43	0.000
TRS3YR	-0.0013472	0.0003850	-3.50	0.001
S = 0.2482 R-Sq = 3.6% R-Sq(adj) = 3.3%				

Our regression analysis indicates that there is a negative relationship between the premium over stock price at the time of option grant and the preceding 3-year share price performance i.e. higher the 3-year share price performance of firms, lower is the premium. This result makes intuitive sense since a good 3-year track record in share price performance reduces the need for firms to put a higher bar for performance for its executives.

Share return volatility and issuance of out-of-money stock options by firms

Out-of-money options have a lower value than a traditional option at the time of grant. We examine if the firms that issue out-of-money options have exhibited high stock return volatility in the past - a higher stock return volatility would offset to some extent the lower option value thus lowering the loss in compensation to the executives. Using firm-year observations, we compare the mean and median of stock return volatility of firms that issue out-of-money stock options to that of firms that issue stock options. We do this exercise for each year in our period of study i.e. 1996 – 2000. The results of the analysis are presented in Table 3.

Table 3: Comparison of stock return volatility

	1996	1997	1998	1999	2000
Mean stock return volatility					
Firms that issued out of money options	0.38	0.40	0.37	0.46	0.56
All firms	0.34	0.35	0.40	0.43	0.47
Median stock return volatility					
Firms that issued out of money options	0.34	0.34	0.32	0.44	0.49
All firms	0.30	0.31	0.35	0.38	0.41

We observe that, with the exception of year 1998, in every other year the mean and median of stock return volatility of firms that issue out-of-money options is greater than that of all firms that issue stock options. This suggests that the firms with higher share price volatility tend to issue out-of-money stock options. As far as the executives in these firms are concerned, the higher stock return volatility offsets partly the loss in option value to them thus decreasing the incentive to show a superior performance.

Part III

Impact of out-of-money options on firms' share price performance

In this section, we analyze the effectiveness of out-of-money options as an incentive tool - do the firms that issue such options exhibit a superior share price performance that reflects the stronger incentives to their executives? We study the 1-year stock price performance of firms both prior to and subsequent to issuance of out-of-money stock options. A study of a sample of 110 firm-year observations reveals that in 60% of the cases, firms reported a worse 1-year subsequent share price performance as compared to 1-year prior performance. This suggests that the issue of out-of-money stock options has not improved the absolute share price performance over a one-year period. We also looked at the relative share price performance of the firms with respect to S&P 500 one-year subsequent to issuing out-of-money options. We observe that 36% of the firms that issued out-of-money options out-performed S&P 500 over a one-year period, while 64% of the firms under-performed S&P 500. The complete distribution is given in Figure 3. Again, we conclude that the issuance of out-of-money stock options has not resulted in any superior stock price performance by firms. As seen earlier, the options are not significantly out of money so as to goad the executives to perform better. Further, the higher stock return volatility of firms that issue out-of-money options offset partly the loss in option value to executives. This could explain the lack of impact on subsequent share price performance of firms.

Are executives really incurring a loss?

To take the above conclusion further, we study closely the total compensation of the executives that are issued out-of-money options. We analyze the change in total compensation of the executives in the year they are issued out-of-money options. Our analysis indicates that

over 53% of the executives with out-of-money option grants had their total compensation increase over previous year by more than 30%. (Total compensation data is taken from ExecuComp database and is inclusive of option grants). Figure 4 gives the complete distribution. This suggests that in several cases, the firms compensate the executives for the loss in option value by increasing their overall package.

We attempt to quantify the loss in option value to executives and examine if the loss is significant enough to drive the executives in delivering improved performance. We define the loss in value as the difference in value between an out-of-money option and an equivalent at-the-money option. Here we are making a simplistic assumption that the firms, in normal course, would have given equivalent at-the-money options to their executives instead of out-of-money option. We use Black-Scholes option pricing model to value the options and derive inputs for our calculation from the ExecuComp database.

As an aside, we would like to highlight a concern here of using risk-neutral pricing techniques. The Black-Scholes option pricing model involves an implicit assumption of hedgeability of the option using the underlying stock. This may be reasonably assumed to hold for shareholders, so option values obtained this way may provide a useful approximation of the cost of the option to shareholders. Employees, however, usually face restrictions in both selling their options and shorting the stock of their firms, but it is not quite clear how significant these restrictions are in aggregate. For example, employees who own the company's stock can create the required hedge by selling a part of these holdings, or use index options or other derivative-based strategies to eliminate part of the risk in options held. In any event, there is no one accepted way of identifying option value to the employee. The risk-neutral value offers a useful benchmark in this case and this methodology has also been used in analysis of similar settings in

the past [for example, valuation of restricted stock grants in Longstaff (1995) or the valuation of non-standard compensation contracts in Johnson and Tian (1999)]

Our analysis indicates that around 70% of the executives that are issued out-of-money options incur a loss in compensation of 10% or less. Figure 5 gives the complete distribution. Thus, the loss in value to executives in a majority of cases does not appear to be large. Hence, though firms seemingly are taking the right step in giving out-of-money stock options to their executives, the loss in option value to the executives is not significant. On top of that, firms increase the overall compensation of executives much more than the loss in option value, which completely reduces the effectiveness of out-of-money options in setting a higher hurdle rate for the executives.

Corporate governance issues

Our analysis shows that firms issue out-of-money options largely to senior management. Around 30% of the out-of-money options were issued to CEOs and 6% to Chairmen of firms. For the firms that issued out-of-money stock options over the period 1996-2000, we examined corporate governance issues such as separation of the jobs of CEO and Chairman, and the inclusion of the CEO in the compensation committee, to see if these variables affect the issuance of out-of-money options and the premium over stock price in an out-of-money option grant. However, we could not detect any significant relationship.

IV. SUMMARY

In this study, we explore the issuance of out-of-money executive stock options by firms and examine their effectiveness as a tool to extract superior performance by the managers. Using

a large sample of U.S. firms over the 1996-2000 period, we obtain results that show that issuance of out-of-the-money stock options by firms is not serving the purpose it is intended to. The share price performance of a majority of firms that issue these options does not improve, both on an absolute and relative basis, 1-year subsequent to issuance of the options. There seem to be several reasons for this.

First, the options are not significantly out of the money so as to drive the managers to perform better. A typical out-of-the-money option can be described as having a maturity of 10 years and the strike price at 23% premium to the stock price at the time of the grant. Second, using simplistic assumptions, we find that the loss in compensation to executives is less than 10% in a majority of cases. The loss in option value is more than offset by an increase in overall compensation to the executives. Around 53% of executives that received out-of-the-money stock options saw an increase in their total compensation by more than 30%. The loss is also offset by a higher than average stock return volatility of firms that issue such options. Furthermore, the issuance of such options for many of the firms seems to be a one-time exercise rather than part of a consistent compensation plan.

Except for exhibiting a high stock return volatility, the firms that issue out-of-the-money stock options do not seem to possess any common set of characteristics in terms of size and industry type. We could not detect any significant relationship between the size of the firm and the issuance of out-of-the-money stock options and the firms that issue such options belong to a diverse set of industries. The relationship between 3-yr prior stock price performance and issuance of out-of-the-money executive stock options is also weak.

APPENDIX

Figure 1: Distribution of exercise price around the stock price at the time of grant

The distribution of exercise price around the stock price at the time of grant, for a sample 357 observations where executives receive out-of-the-money stock option grants over the period 1996-2000. Data is taken from ExecuComp database using executive-year as a unit of observation.

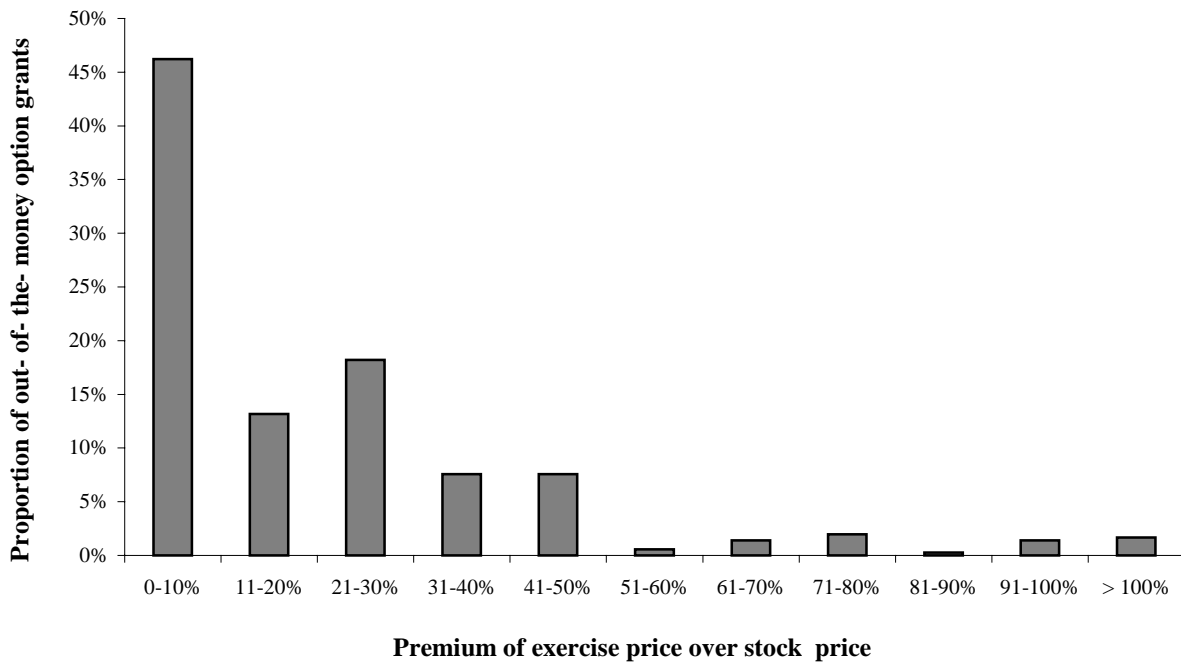


Figure 2: Firm performance and issuance of out-of-the-money options

The data is taken from ExecuComp database. The sample includes 41,934 executive-year observations for the period 1996-2000, for which the executives have nonzero holdings of stock options and the database includes a three-year cumulative stock return for the company. The stock return includes the year during which the out-of-the-money option is granted.

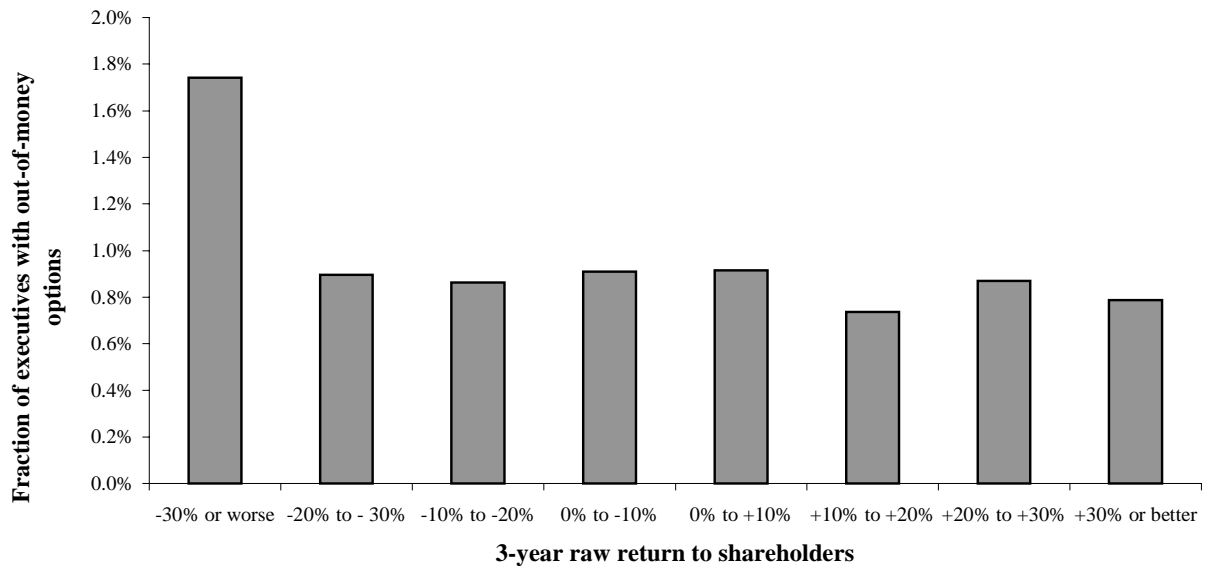


Figure 3: Relative firm performance one-year subsequent to issuing out-of-money options

The sample includes ex-post share price performance data of 110 firms that issued out-of-money stock options over the period 1996-2000. The sample is drawn from Standard & Poor's ExecuComp database. The share price data for the firms and S&P 500 was collected from Bloomberg.

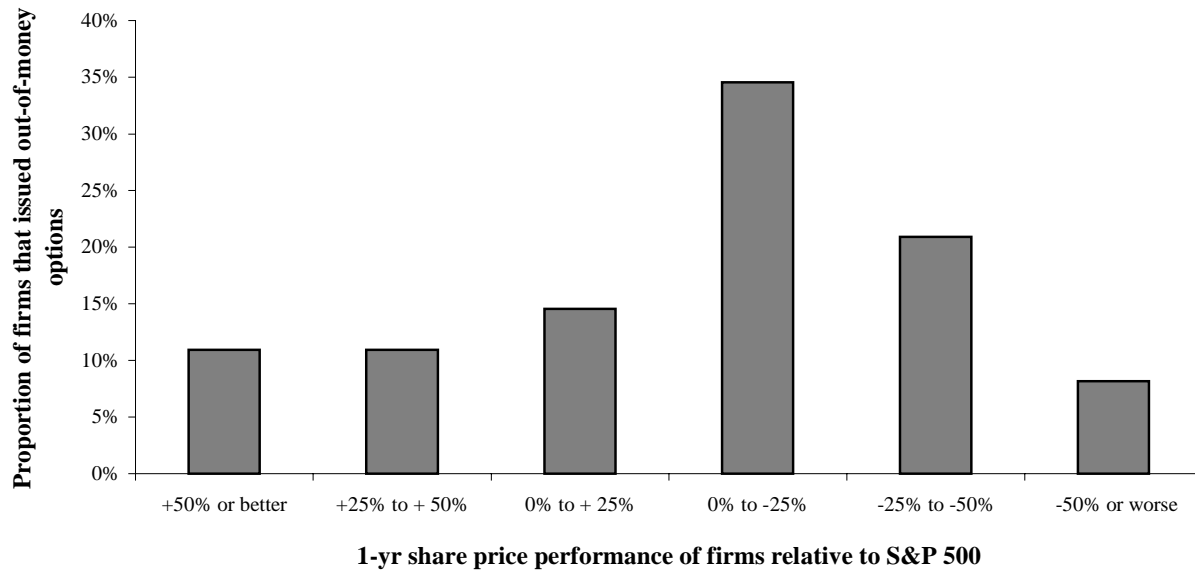


Figure 4: Change in executive compensation levels

The data is taken from ExecuComp database using executive-year as a unit of observation. We obtained the total compensation data for 306 executives that receive out-of-the-money stock option grants over the period 1996-2000.

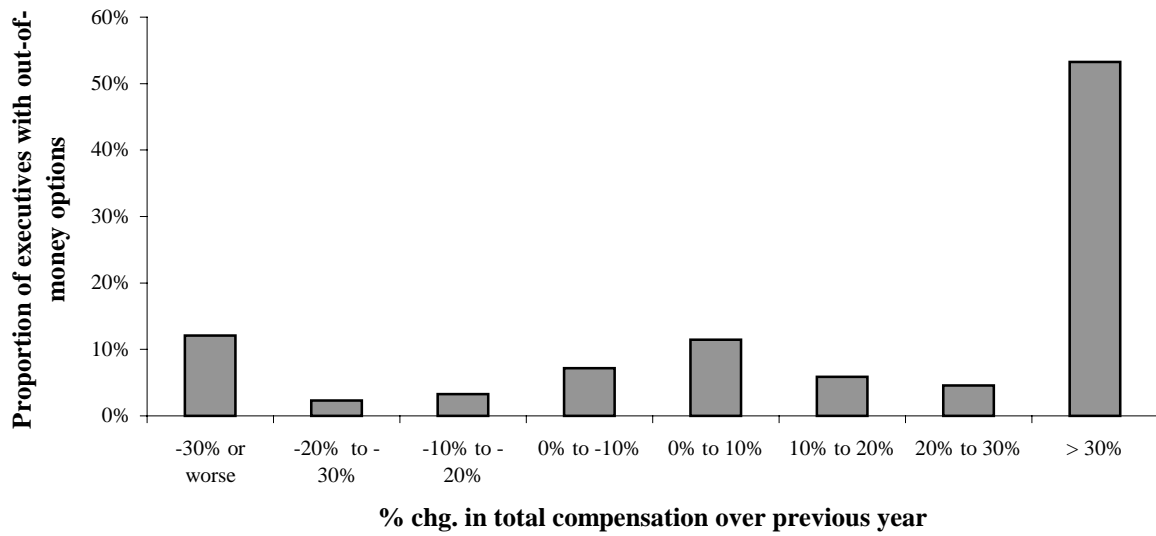
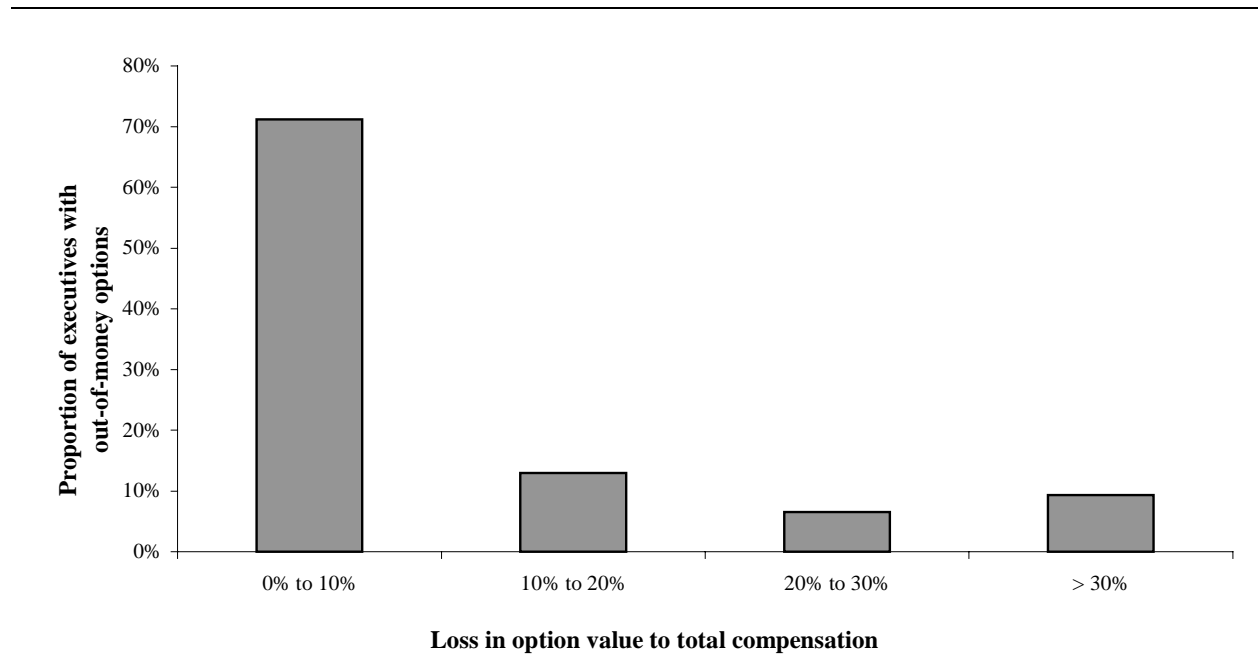


Figure 5: Loss in executive compensation due to issuance of out-of-money options

We use a sample of 306 executives that receive out-of-money stock option grants over the period 1996-2000. The data is taken from ExecuComp database using executive-year as a unit of observation. We calculated the value of out-of-money stock options and value of an equivalent at-the-money options using Black-Scholes option valuation model. The inputs for option valuation such as stock return volatility, dividend yield, maturity, strike price and exercise price were obtained from the ExecuComp database.



References:

1. Brenner, M., R.Sundaram, and Yermack, D., 1998, Altering the terms of executive stock options, *Journal of Financial Economics*
2. Carpenter, J., 1997, The exercise and valuation of executive stock options, *Journal of Financial Economics*
3. Hall, B.J., Liebman, J.B., 1998, Are CEOs really paid like bureaucrats? *Quarterly Journal of Economics*
4. Jensen, M.C., Murphy, K.J., 1990, Performance pay and top management incentives, *Journal of Political Economy*
5. Johnson, S. and Tian, Y. 1998, Indexed executives stock options, *Journal of Financial Economics*
6. Johnson, S. and Tian, Y. 1999, The value and incentive effects of nontraditional executive stock option plans, *Journal of Financial Economics*
7. Morgenson, Gretchen, 1998, Stock options are not a free lunch, *Forbes*, May 18
8. Murphy, K.J. (1999) Executive Compensation, in *Handbook of Labor Economics Vol III*, (Eds: O. Ashenfelter and D. Card), North Holland
9. Saly, P.J., 1994, Repricing executive stock options in a down market, *Journal of Accounting and Economics*
10. Yermack, D., 1995, Do corporations award CEO stock options effectively? *Journal of Financial Economics*
11. Yermack, D., 1997, Good Timing: CEO stock option awards and company news announcements, *Journal of Finance*